Small Business Innovation Research/Small Business Tech Transfer

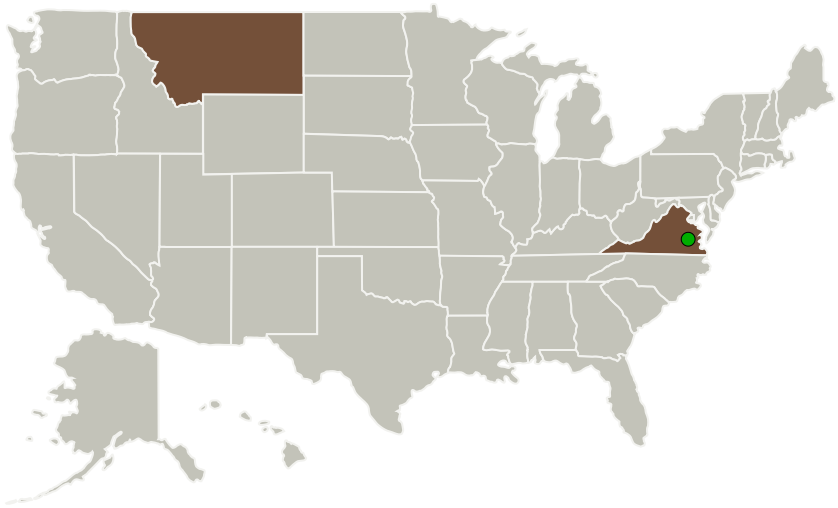
Compact, Rugged and Low-Cost Atmospheric Ozone DIAL Transmitter, Phase I

Completed Technology Project (2013 - 2013)

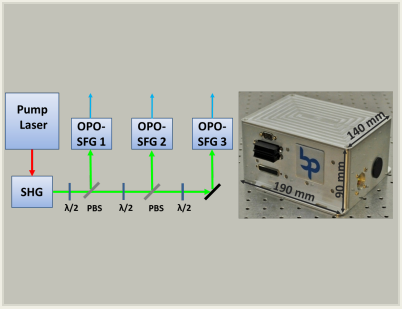
Project Introduction

Bridger Photonics Inc. (Bridger) proposes to develop the most compact, efficient and low-cost ultra-violet ozone differential absorption lidar (DIAL) transmitter available. This system will use a frequency-doubled, conductively-cooled, q-switched Nd:YAG laser to pump a combination optical parametric oscillator (OPO) and sum frequency generation (SFG) cavity to deliver 6 ns, 1.5 mJ and 1 kHz pulses at three wavelengths within the 280 nm to 316 nm ozone DIAL band. Bridger will employ mechanically robust and environmentally insensitive monolithic laser and OPO designs making the transmitter well suited for continuous DIAL measurements from ground-based, airborne and space-based platforms. Bridger estimates that the high efficiency and compact packaging offered by the proposed pump laser and OPO will result in an ozone DIAL transmitter that weighs <30 kg (including the control electronics), consumes less than 550 W of power at 110VAC, and costs less than $75,000 per unit.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Bridger Photonics, Inc.	Lead Organization	Industry	Bozeman, Montana
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia



Compact, Rugged and Low-Cost Atmospheric Ozone DIAL Transmitter

Table of Contents

Compact, Rugged and Low-Cost Atmospheric Ozone DIAL Transmitter, Phase I

Completed Technology Project (2013 - 2013)

Primary U.S. Work Locations	
Montana	Virginia

Project Transitions

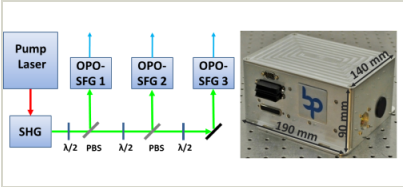
May 2013: Project Start

November 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/137976)*

Images



Project Image
Compact, Rugged and Low-Cost Atmospheric Ozone DIAL Transmitter
(https://techport.nasa.gov/image/127678)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Bridger Photonics, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

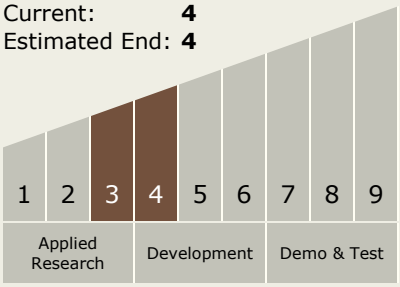
Carlos Torrez

Principal Investigator:

Mike Thorpe

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



Compact, Rugged and Low-Cost Atmospheric Ozone DIAL Transmitter, Phase I

Completed Technology Project (2013 - 2013)

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.5 Lasers

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System